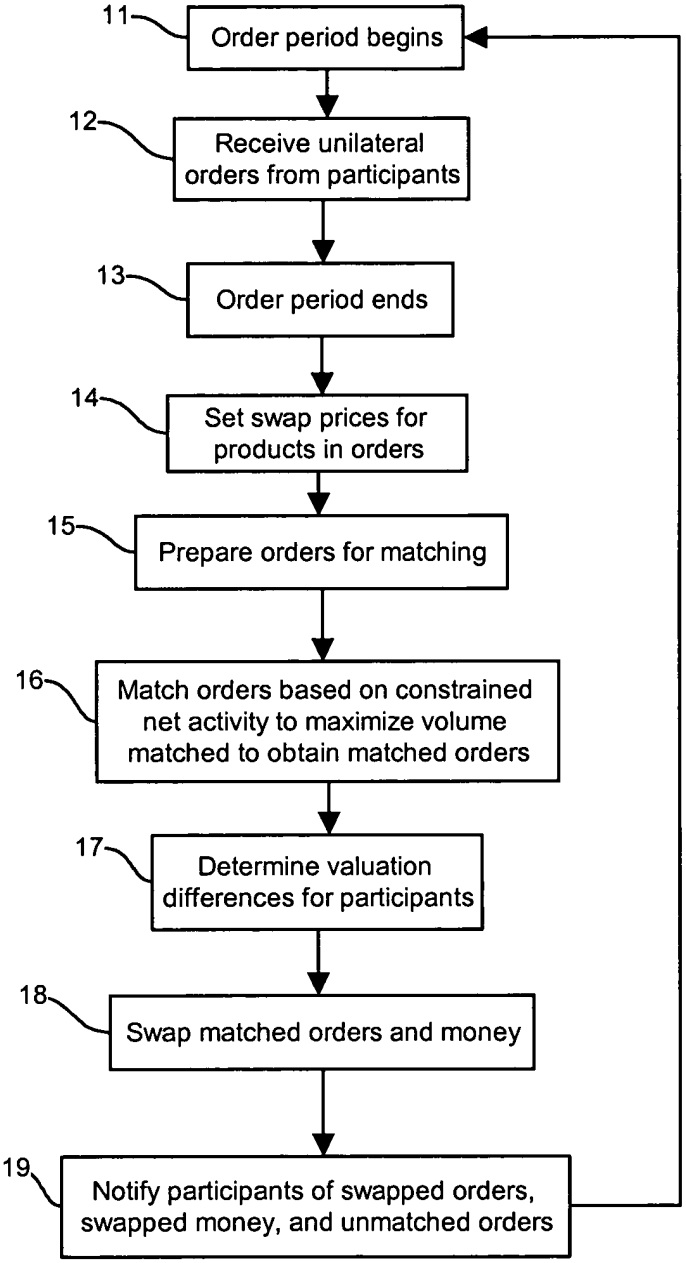

11
Order period begins
12
Receive unilateral orders from participants
13
Order period ends
14
Set swap prices for products in orders
15
Prepare orders for matching
16
Match orders based on constrained net activity to maximize volume matched to obtain matched orders
17
Determine valuation differences for participants
18
Swap matched orders and money
19
Notify participants of swapped orders, swapped money, and unmatched orders

Fig. 1

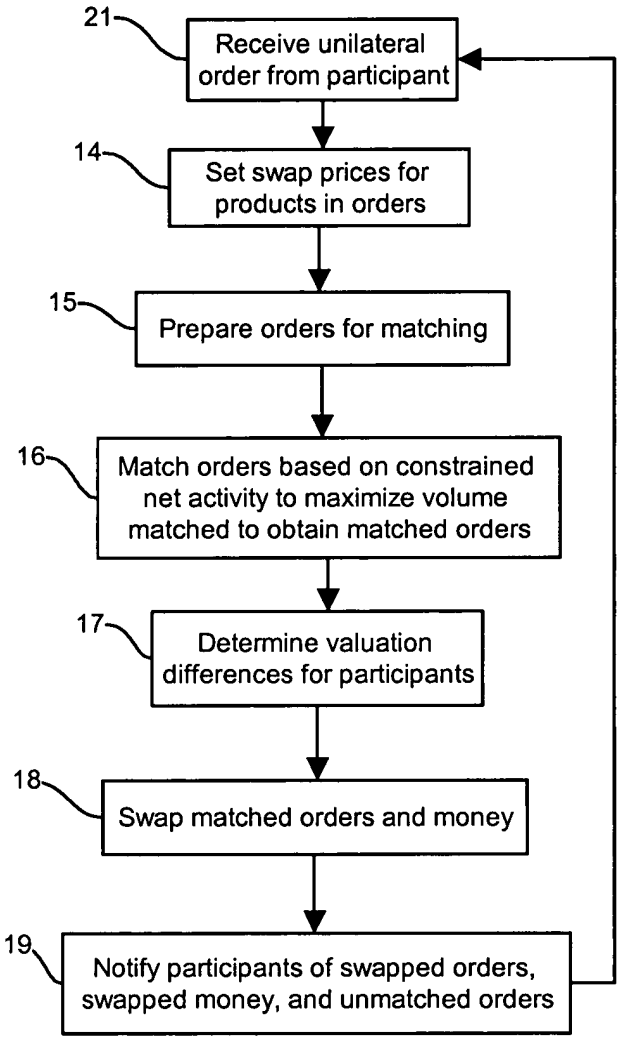

21
Receive unilateral order from participant
14
Set swap prices for products in orders
15
Prepare orders for matching
16
Match orders based on constrained net activity to maximize volume matched to obtain matched orders
17
Determine valuation differences for participants
18
Swap matched orders and money
19
Notify participants of swapped orders, swapped money, and unmatched orders

Fig. 2

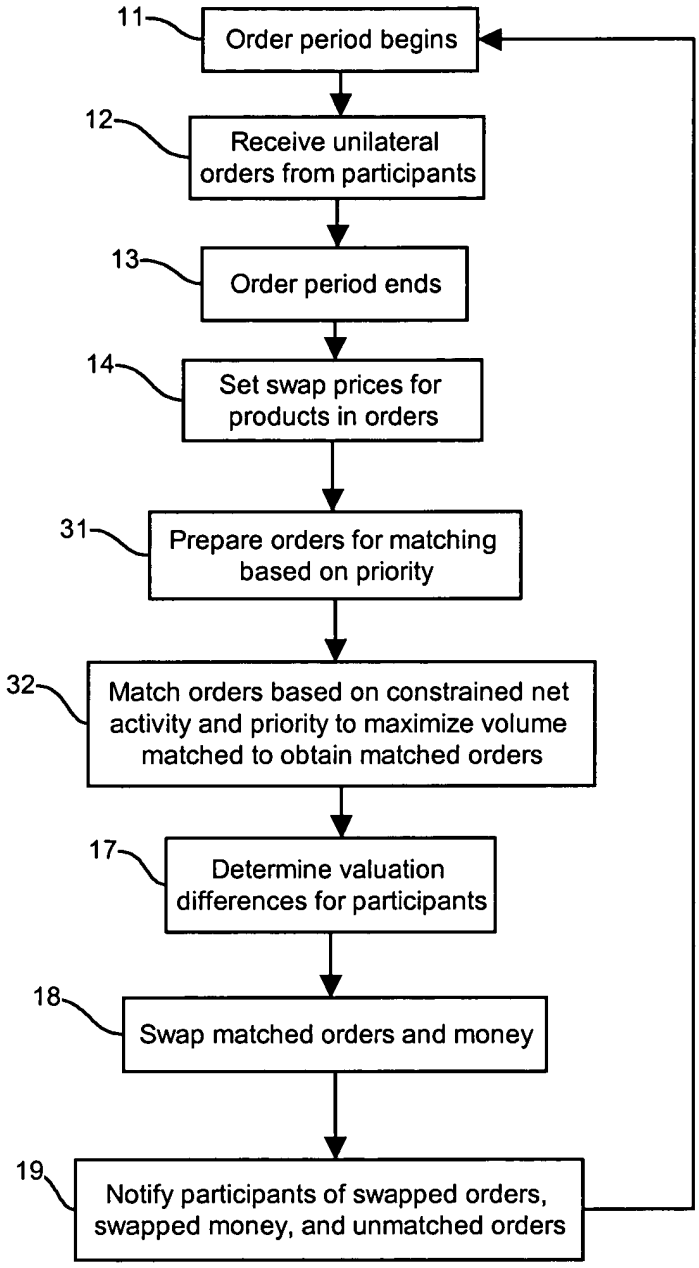

11
Order period begins
12
Receive unilateral orders from participants
13
Order period ends
14
Set swap prices for products in orders
31
Prepare orders for matching based on priority
32
Match orders based on constrained net activity and priority to maximize volume matched to obtain matched orders
17
Determine valuation differences for participants
18
Swap matched orders and money
19
Notify participants of swapped orders, swapped money, and unmatched orders

Fig. 3

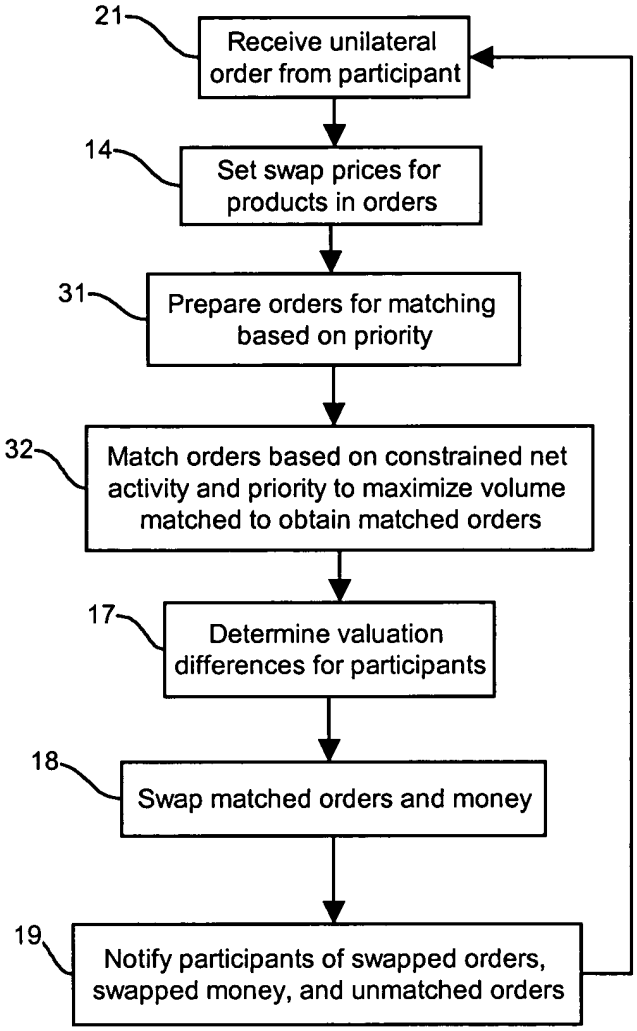

21
Receive unilateral order from participant
14
Set swap prices for products in orders
31
Prepare orders for matching based on priority
32
Match orders based on constrained net activity and priority to maximize volume matched to obtain matched orders
17
Determine valuation differences for participants
18
Swap matched orders and money
19
Notify participants of swapped orders, swapped money, and unmatched orders

Fig. 4

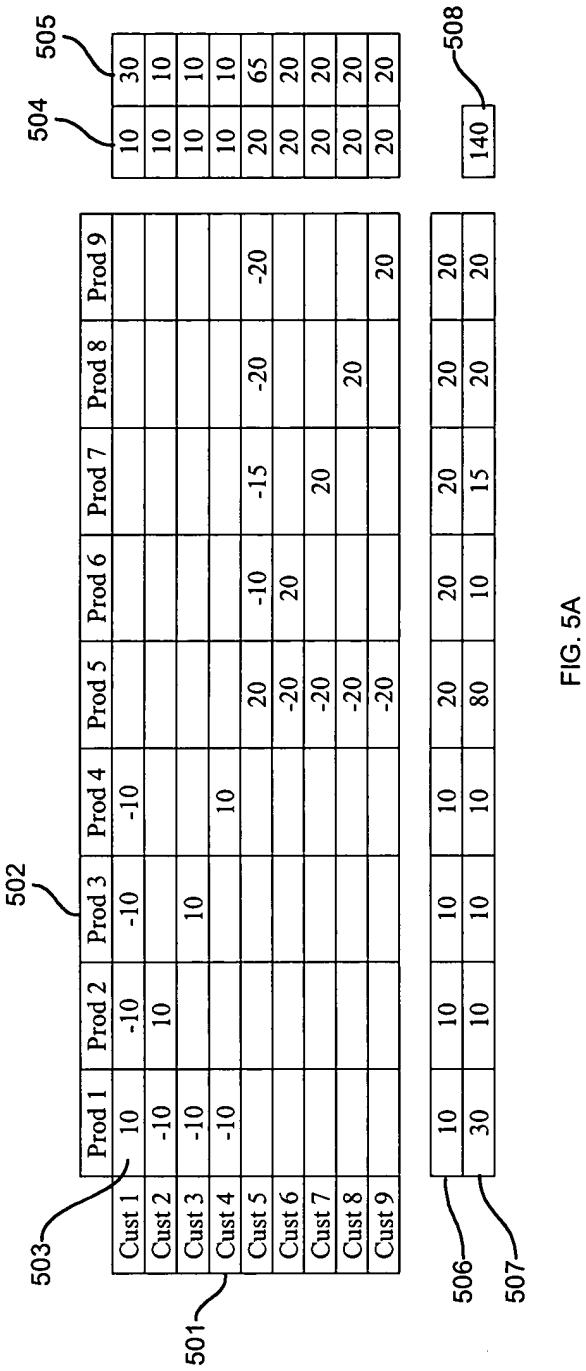

505
504
508
502
503
501
506
507
Prod 1
Prod 2
Prod 3
Prod 4
Prod 5
Prod 6
Prod 7
Prod 8
Prod 9
Cust 1
Cust 2
Cust 3
Cust 4
Cust 5
Cust 6
Cust 7
Cust 8
Cust 9
10 -10 -10 -10
-10 10
-10 10
-10
10
20 -10 -15 -20 -20
-20 20 20
-20 20
-20 20
-20
20
10 10 10 10 20 20 20 20 20
30 10 10 10 80 10 15 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
30 10 10 10 65 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
10 10 10 10 20 20 20 20 20
140

FIG. 5A

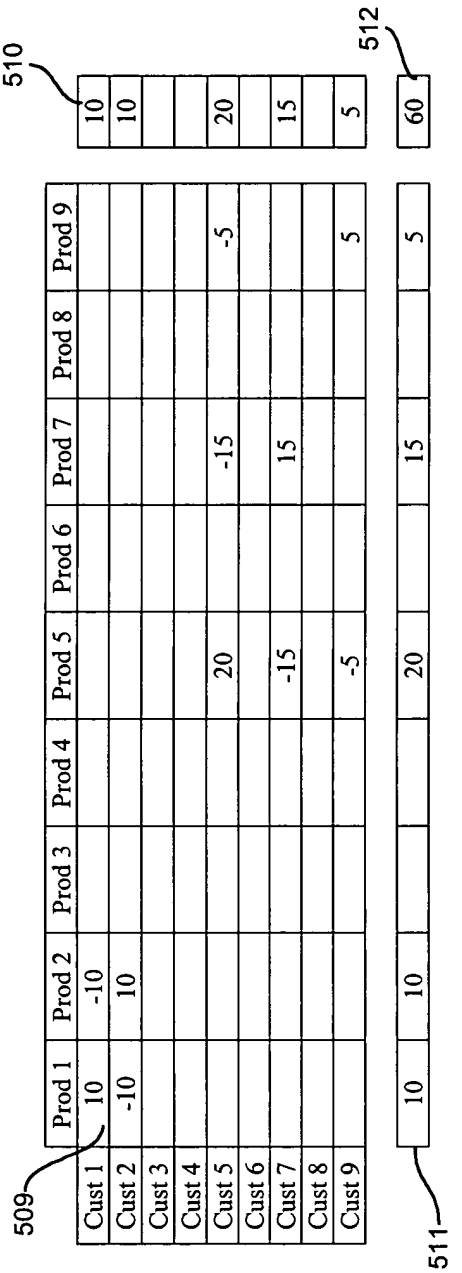

510
512
509
511
Prod 1
Prod 2
Prod 3
Prod 4
Prod 5
Prod 6
Prod 7
Prod 8
Prod 9
Cust 1
Cust 2
Cust 3
Cust 4
Cust 5
Cust 6
Cust 7
Cust 8
Cust 9
10
-10
10
-10
10
10
20
-5
-15
15
-15
15
20
-5
5
5
5
10
10
10
20
15
5
60

FIG. 5B

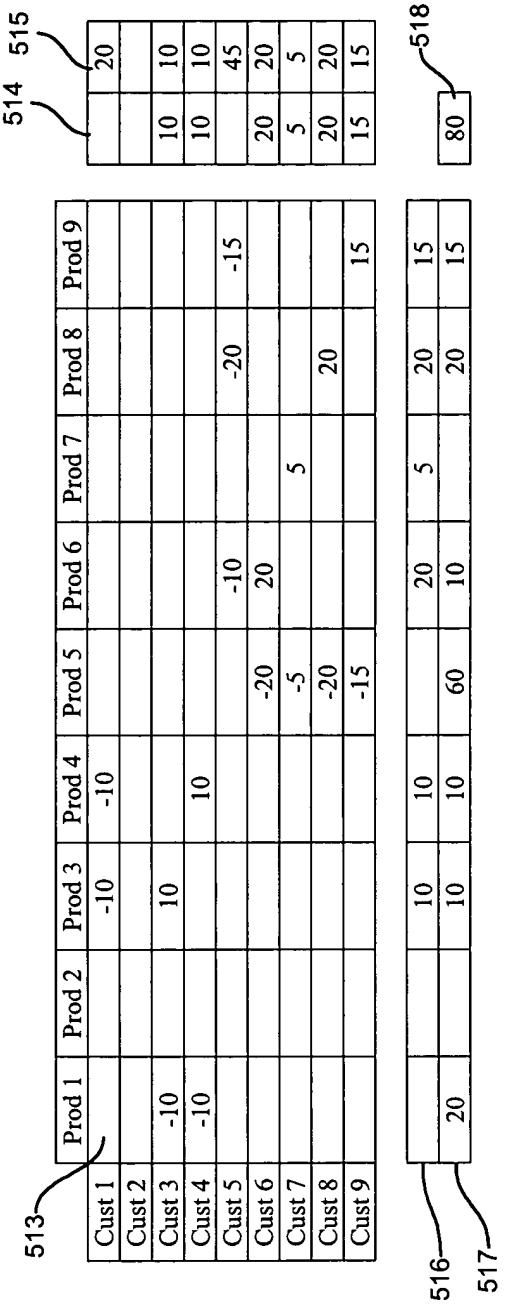

513
514
515
516
517
518
Prod 1
Prod 2
Prod 3
Prod 4
Prod 5
Prod 6
Prod 7
Prod 8
Prod 9
Cust 1
Cust 2
Cust 3
Cust 4
Cust 5
Cust 6
Cust 7
Cust 8
Cust 9
-10
-10
-10
10
-10
-10
-20
20
-5
5
-20
20
-15
-10
-20
-15
5
20
15
10
10
20
5
20
15
20
10
10
10
60
10
20
10
10
20
20
15
15
20
10
10
45
20
5
20
15
80

FIG. 5C

519

	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9
Cust 1	9	18	7	22					
Cust 2	13	12							
Cust 3	1		6						
Cust 4	21			15					
Cust 5					23	10	5	3	19
Cust 6					2	16			
Cust 7					20		14		
Cust 8					17			11	
Cust 9					4				8

FIG. 5D

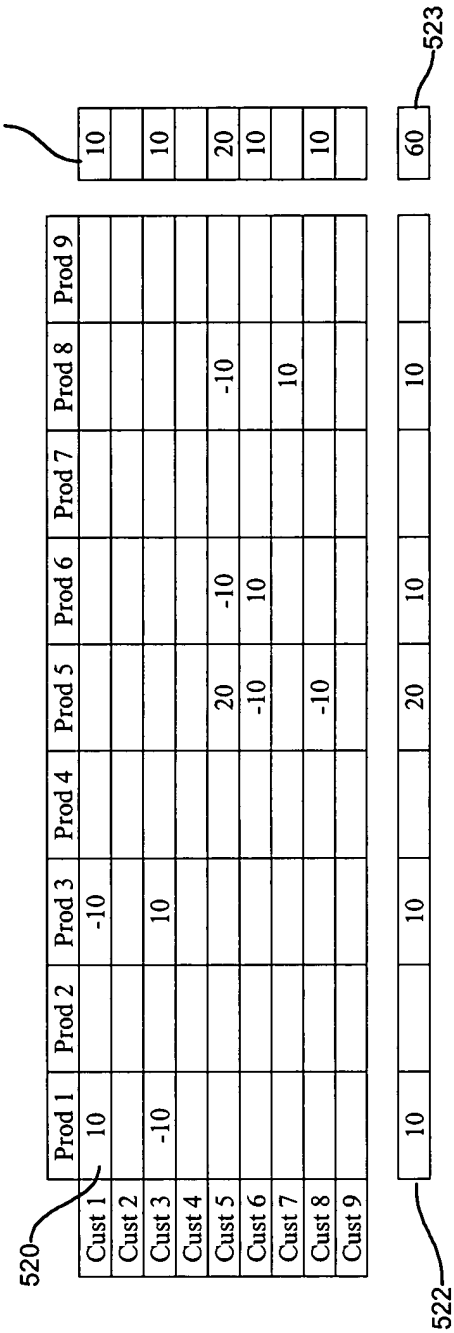

521
523
520
522
Prod 1
Prod 2
Prod 3
Prod 4
Prod 5
Prod 6
Prod 7
Prod 8
Prod 9
Cust 1
Cust 2
Cust 3
Cust 4
Cust 5
Cust 6
Cust 7
Cust 8
Cust 9
10
-10
10
-10
20
-10
10
-10
10
-10
10
10
20
10
10
10
60

FIG. 5E

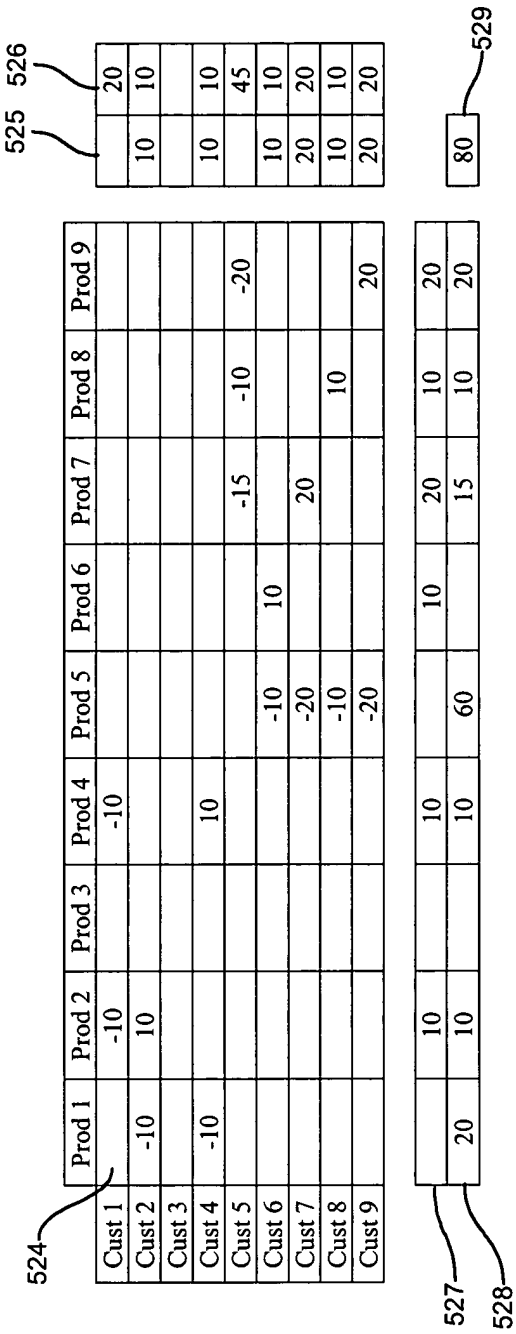
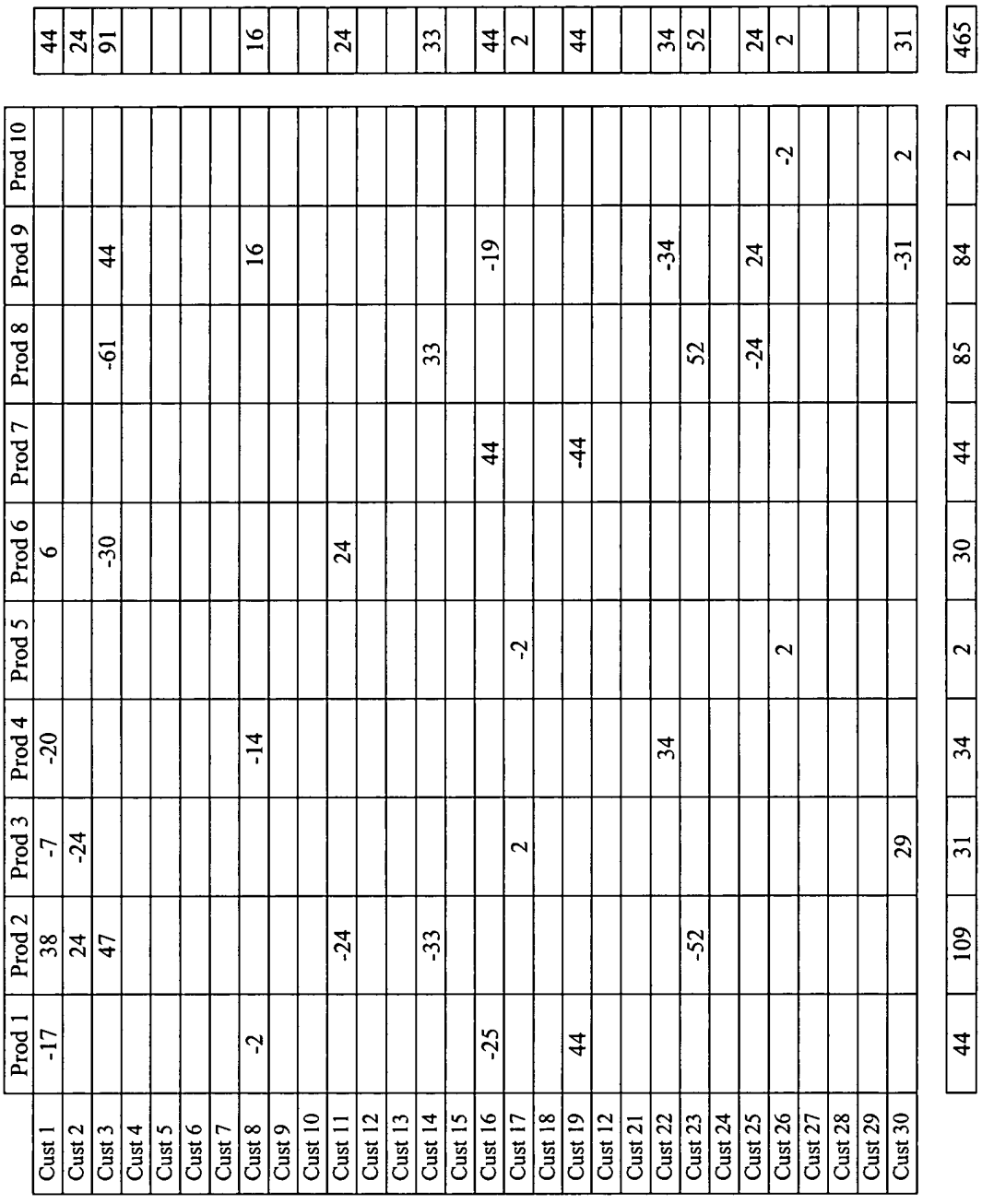

524
525
526
527
528
529
Prod 1
Prod 2
Prod 3
Prod 4
Prod 5
Prod 6
Prod 7
Prod 8
Prod 9
Cust 1
Cust 2
Cust 3
Cust 4
Cust 5
Cust 6
Cust 7
Cust 8
Cust 9

FIG. 5F

	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10		
Cust 1	-17	92	-61	-20		40					132	98
Cust 2		97	-24								97	24
Cust 3		95				-30		-61	46		141	91
Cust 4				-96	-68				-3			167
Cust 5		-39			70				-95		70	134
Cust 6				44			96				140	
Cust 7	-18	-37		-50	-32							137
Cust 8	-63			-83	22				24		46	146
Cust 9	-53	-19	-40									112
Cust 10		-20								71	71	20
Cust 11		-24				29					29	24
Cust 12		-80						-54				134
Cust 13										-41		41
Cust 14	-59	-46					-67	83			83	172
Cust 15												
Cust 16	-89	79			9		57		-19		145	108
Cust 17			2		-13					-24	2	37
Cust 18	-64											64
Cust 19	82						-44				82	44
Cust 12												
Cust 21				-18		-14		-45				77
Cust 22		-91	-13	34					-50		34	154
Cust 23		-52		-14				92			92	66
Cust 24	-31		-68	-4					-78			181
Cust 25			-52	-49		-95		-89	24		24	285
Cust 26			-10		31					-18	31	28
Cust 27	43		59								102	
Cust 28										48	48	
Cust 29								-53				53
Cust 30			29	-12					-81	19	48	93

125	363	90	78	132	69	153	175	94	138	
394	408	268	346	113	139	111	302	326	83	1417

FIG. 6A



	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10	
Cust 1	-17	38	-7	-20		6					44
Cust 2		24	-24								24
Cust 3		47				-30		-61	44		91
Cust 4											
Cust 5											
Cust 6											
Cust 7											
Cust 8	-2			-14					16		16
Cust 9											
Cust 10											
Cust 11		-24				24					24
Cust 12											
Cust 13											
Cust 14		-33						33			33
Cust 15											
Cust 16	-25						44		-19		44
Cust 17			2		-2						2
Cust 18											
Cust 19	44						-44				44
Cust 12											
Cust 21											
Cust 22				34					-34		34
Cust 23		-52						52			52
Cust 24											
Cust 25								-24	24		24
Cust 26					2					-2	2
Cust 27											
Cust 28											
Cust 29											
Cust 30			29						-31	2	31
	44	109	31	34	2	30	44	85	84	2	465

FIG. 6B

	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10
Cust 1	71	78	50	74		14				
Cust 2		38	79							
Cust 3		28				7		31	53	
Cust 4				2	35				33	
Cust 5		67			81				39	
Cust 6				43			17			
Cust 7	30	80		73	51					
Cust 8	20			55	54				5	
Cust 9	70	3	27							
Cust 10		44								61
Cust 11		23				66				
Cust 12		41						77		
Cust 13										32
Cust 14	12	21					25	63		
Cust 15										
Cust 16	82	18			15		75		9	
Cust 17			6		10					24
Cust 18	45									
Cust 19	34						11			
Cust 12										
Cust 21				56		46		36		
Cust 22		26	64	52					40	
Cust 23		16		29				72		
Cust 24	48		22	8					65	
Cust 25			42	76		68		19	60	
Cust 26			1		57					69
Cust 27	49		58							
Cust 28										62
Cust 29								37		
Cust 30			47	13					59	4

FIG. 6C

	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10	
Cust 1		11	-7	-10		6					17
Cust 2		24	-24								24
Cust 3		89				-30		-61	2		91
Cust 4											
Cust 5											
Cust 6											
Cust 7											
Cust 8				-24					24		24
Cust 9											
Cust 10											
Cust 11		-24				24					24
Cust 12											
Cust 13											
Cust 14		-33						33			33
Cust 15											
Cust 16	-44	19					44		-19		63
Cust 17			2		-2						2
Cust 18											
Cust 19	44						-44				44
Cust 12											
Cust 21											
Cust 22		-34		34							34
Cust 23		-52						52			52
Cust 24											
Cust 25								-24	24		24
Cust 26					2					-2	2
Cust 27											
Cust 28											
Cust 29											
Cust 30			29						-31	2	31
	44	143	31	34	2	30	44	85	50	2	465

FIG. 6D

	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10		
Cust 1	-17	81	-54	-10		34					115	81
Cust 2		73									73	
Cust 3		6							44		50	
Cust 4				-96	-68				-3			167
Cust 5		-39			70				-95		70	134
Cust 6				44			96				140	
Cust 7	-18	-37		-50	-32							137
Cust 8	-63			-59	22						22	122
Cust 9	-53	-19	-40									112
Cust 10		-20								71	71	20
Cust 11						5					5	
Cust 12		-80						-54				134
Cust 13										-41		41
Cust 14	-59	-13					-67	50			50	139
Cust 15												
Cust 16	-45	60			9		13				82	45
Cust 17					-11					-24		35
Cust 18	-64											64
Cust 19	38										38	
Cust 12												
Cust 21				-18		-14		-45				77
Cust 22		-57	-13						-50			120
Cust 23				-14				40			40	14
Cust 24	-31		-68	-4					-78			181
Cust 25			-52	-49		-95		-65				261
Cust 26			-10		29					-16	29	26
Cust 27	43		59								102	
Cust 28										48	48	
Cust 29								-53				53
Cust 30				-12					-50	17	17	62

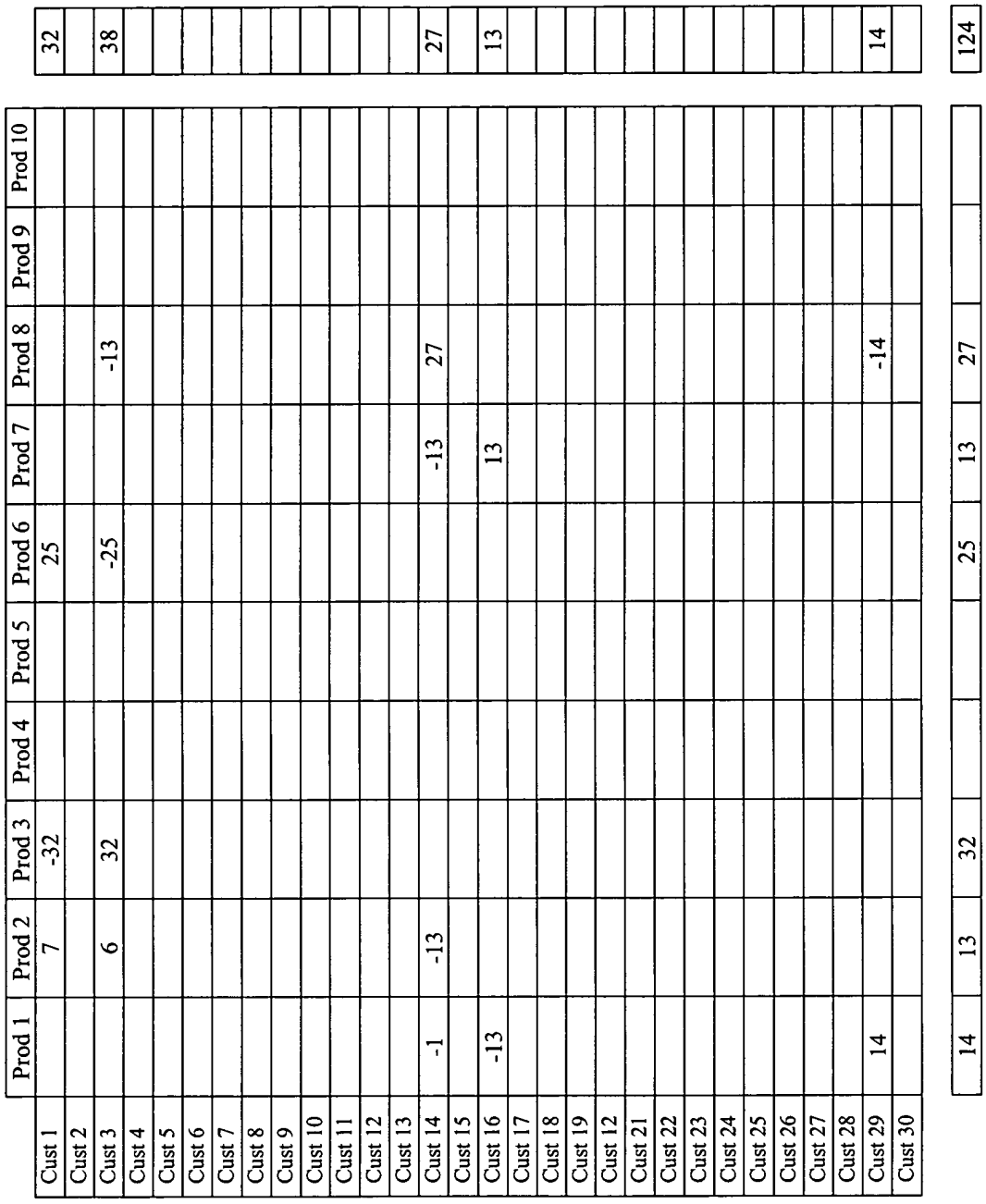
81	220	59	44	130	39	109	90	44	136	
350	265	237	312	111	109	67	217	276	81	952

FIG. 6E

	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10		
Cust 1	-17	81	-82	-10		34					115	109
Cust 2		73	73								146	
Cust 3		6	32			-54		-38	44		82	92
Cust 4				-96	-68			-96	-3			263
Cust 5	-95	-39			70				-95		70	229
Cust 6				44			96				140	
Cust 7	-18	-37		-50	-32		-23					160
Cust 8	-63			-59	22						22	122
Cust 9	-53	-19	-40									112
Cust 10		-20								150	150	20
Cust 11						5					5	
Cust 12		-80						-54				134
Cust 13								-15		-41		56
Cust 14	-59	-13					-67	50			50	139
Cust 15												
Cust 16	-45	60			9		13				82	45
Cust 17					-11					-24		35
Cust 18	-64											64
Cust 19	38										38	
Cust 12				78							78	
Cust 21				-18		-14		-45				77
Cust 22		-57	-13						-50			120
Cust 23				-14				40			40	14
Cust 24	-31		-68	-4					-78			181
Cust 25			-52	-49		-95		-65	-93			354
Cust 26			-10		29					-16	29	26
Cust 27	43		59								102	
Cust 28										48	48	
Cust 29	14							-53			14	53
Cust 30				-12					-50	17	17	62

95	220	164	122	130	39	109	90	44	215	
445	265	265	312	111	163	90	366	369	81	1228

FIG. 6F



	Prod 1	Prod 2	Prod 3	Prod 4	Prod 5	Prod 6	Prod 7	Prod 8	Prod 9	Prod 10	
Cust 1		7	-32			25					32
Cust 2											
Cust 3		6	32			-25		-13			38
Cust 4											
Cust 5											
Cust 6											
Cust 7											
Cust 8											
Cust 9											
Cust 10											
Cust 11											
Cust 12											
Cust 13											
Cust 14	-1	-13					-13	27			27
Cust 15											
Cust 16	-13						13				13
Cust 17											
Cust 18											
Cust 19											
Cust 12											
Cust 21											
Cust 22											
Cust 23											
Cust 24											
Cust 25											
Cust 26											
Cust 27											
Cust 28											
Cust 29	14							-14			14
Cust 30											
	14	13	32			25	13	27			124

FIG. 6G

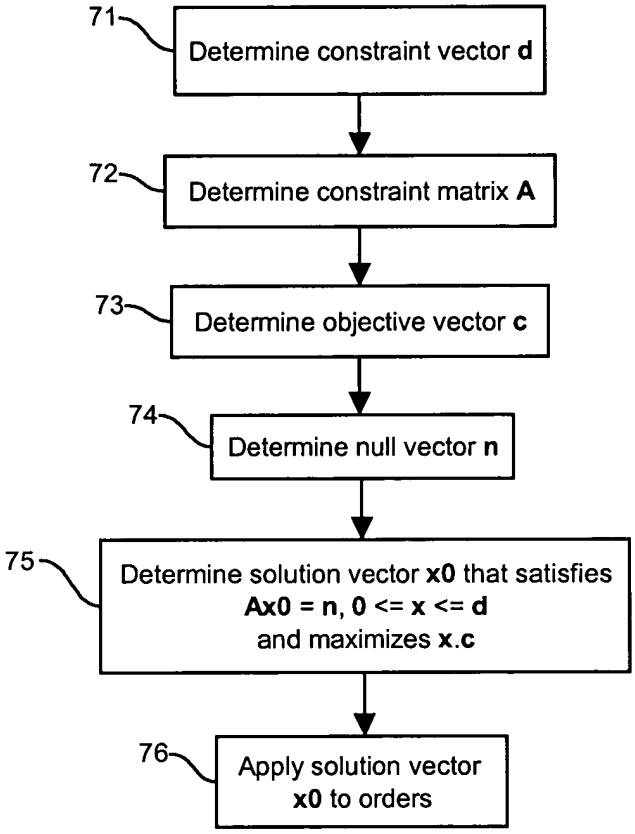

71
Determine constraint vector **d**
72
Determine constraint matrix **A**
73
Determine objective vector **c**
74
Determine null vector **n**
75
Determine solution vector **x0** that satisfies
Ax0 = n, 0 <= x <= d
and maximizes **x.c**
76
Apply solution vector
x0 to orders

FIG. 7

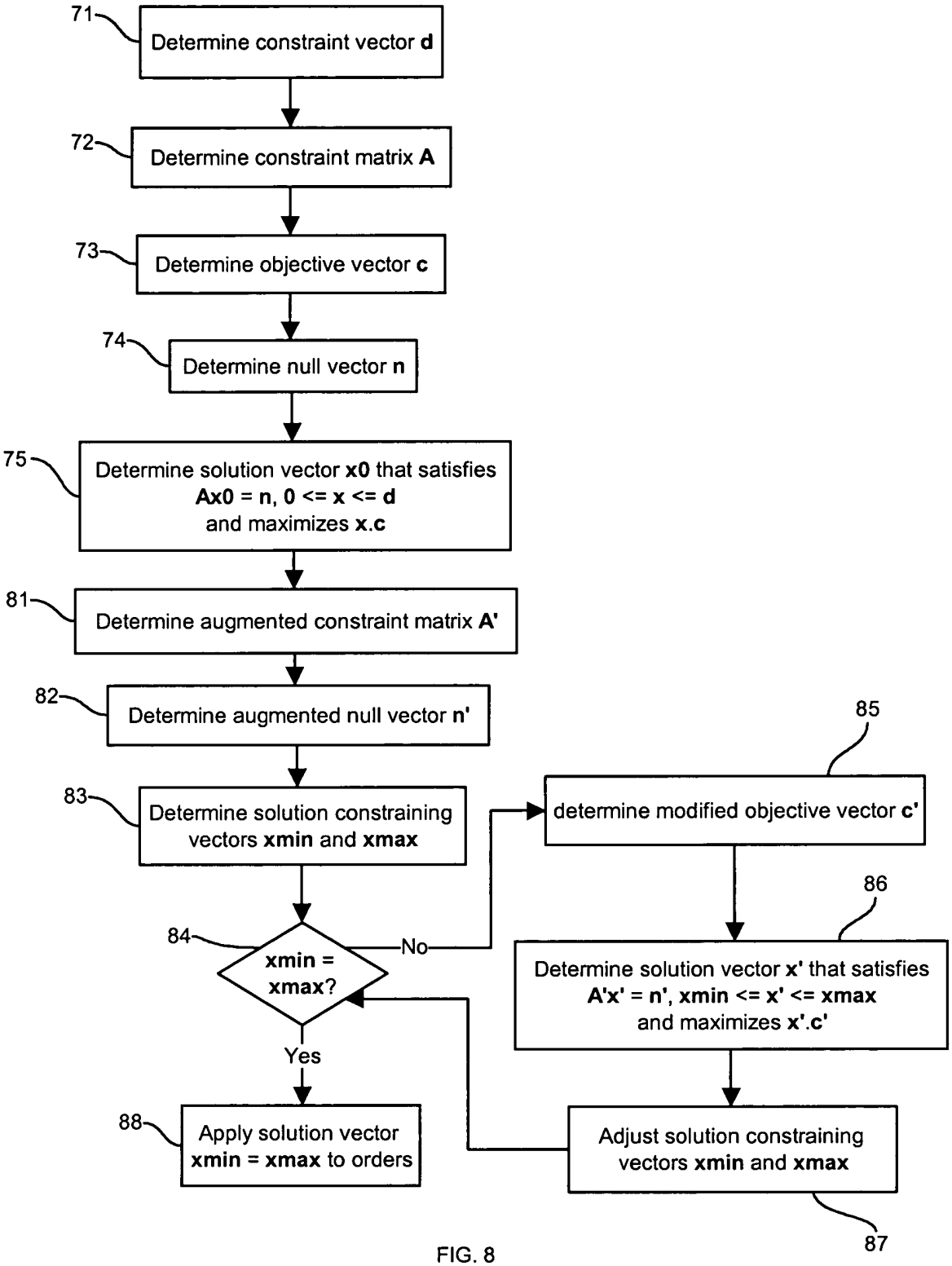

71
Determine constraint vector **d**
72
Determine constraint matrix **A**
73
Determine objective vector **c**
74
Determine null vector **n**
75
Determine solution vector **x0** that satisfies **Ax0 = n, 0 <= x <= d** and maximizes **x.c**
81
Determine augmented constraint matrix **A'**
82
Determine augmented null vector **n'**
83
Determine solution constraining vectors **xmin** and **xmax**
84
xmin = xmax?
No
Yes
85
determine modified objective vector **c'**
86
Determine solution vector **x'** that satisfies **A'x' = n', xmin <= x' <= xmax** and maximizes **x'.c'**
87
Adjust solution constraining vectors **xmin** and **xmax**
88
Apply solution vector **xmin = xmax** to orders

FIG. 8

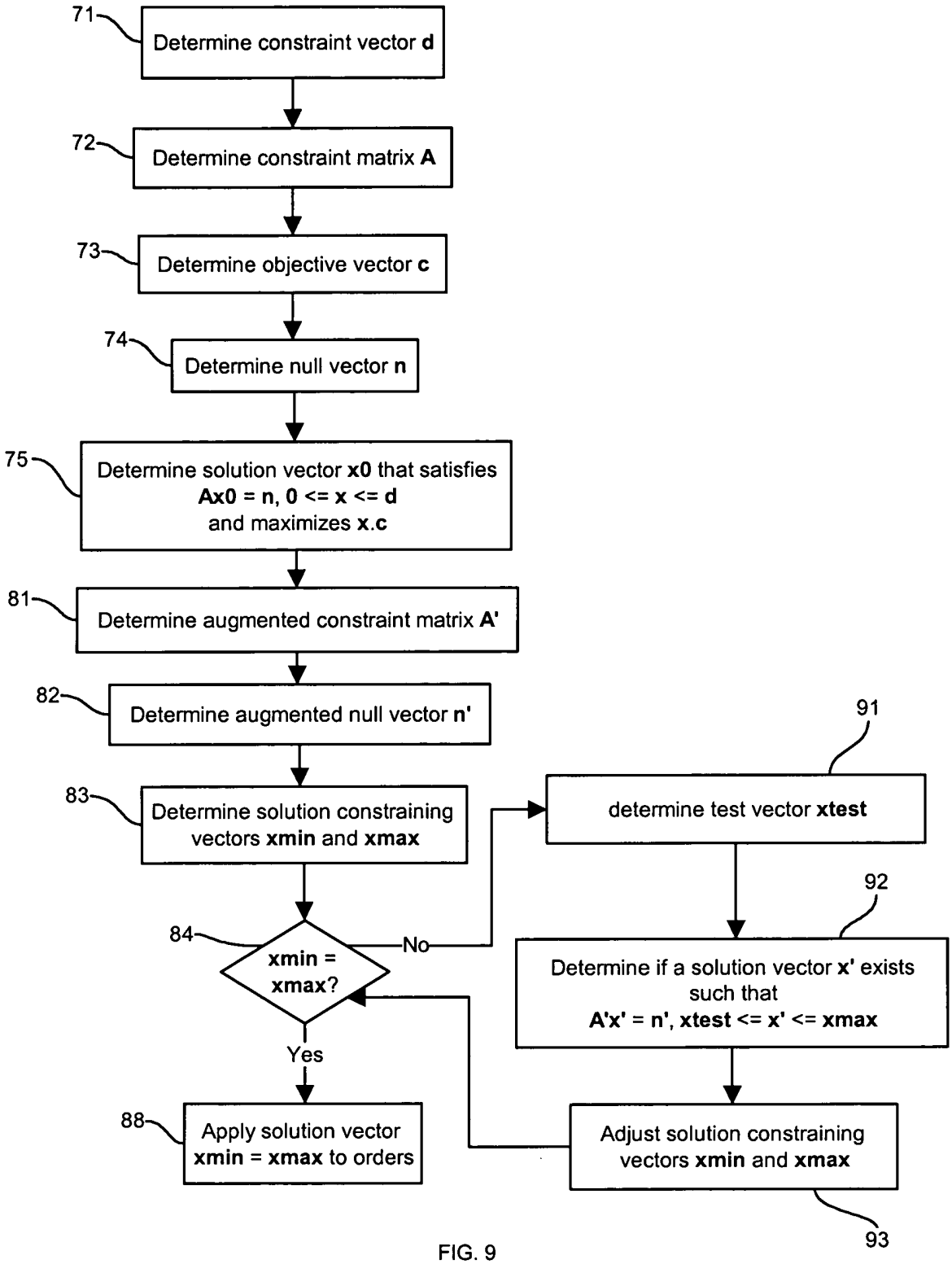

71
Determine constraint vector **d**
72
Determine constraint matrix **A**
73
Determine objective vector **c**
74
Determine null vector **n**
75
Determine solution vector **x0** that satisfies **Ax0 = n, 0 <= x <= d** and maximizes **x.c**
81
Determine augmented constraint matrix **A'**
82
Determine augmented null vector **n'**
83
Determine solution constraining vectors **xmin** and **xmax**
84
xmin = xmax?
No
Yes
88
Apply solution vector **xmin = xmax** to orders
91
determine test vector **xtest**
92
Determine if a solution vector **x'** exists such that **A'x' = n', xtest <= x' <= xmax**
Adjust solution constraining vectors **xmin** and **xmax**
93

FIG. 9

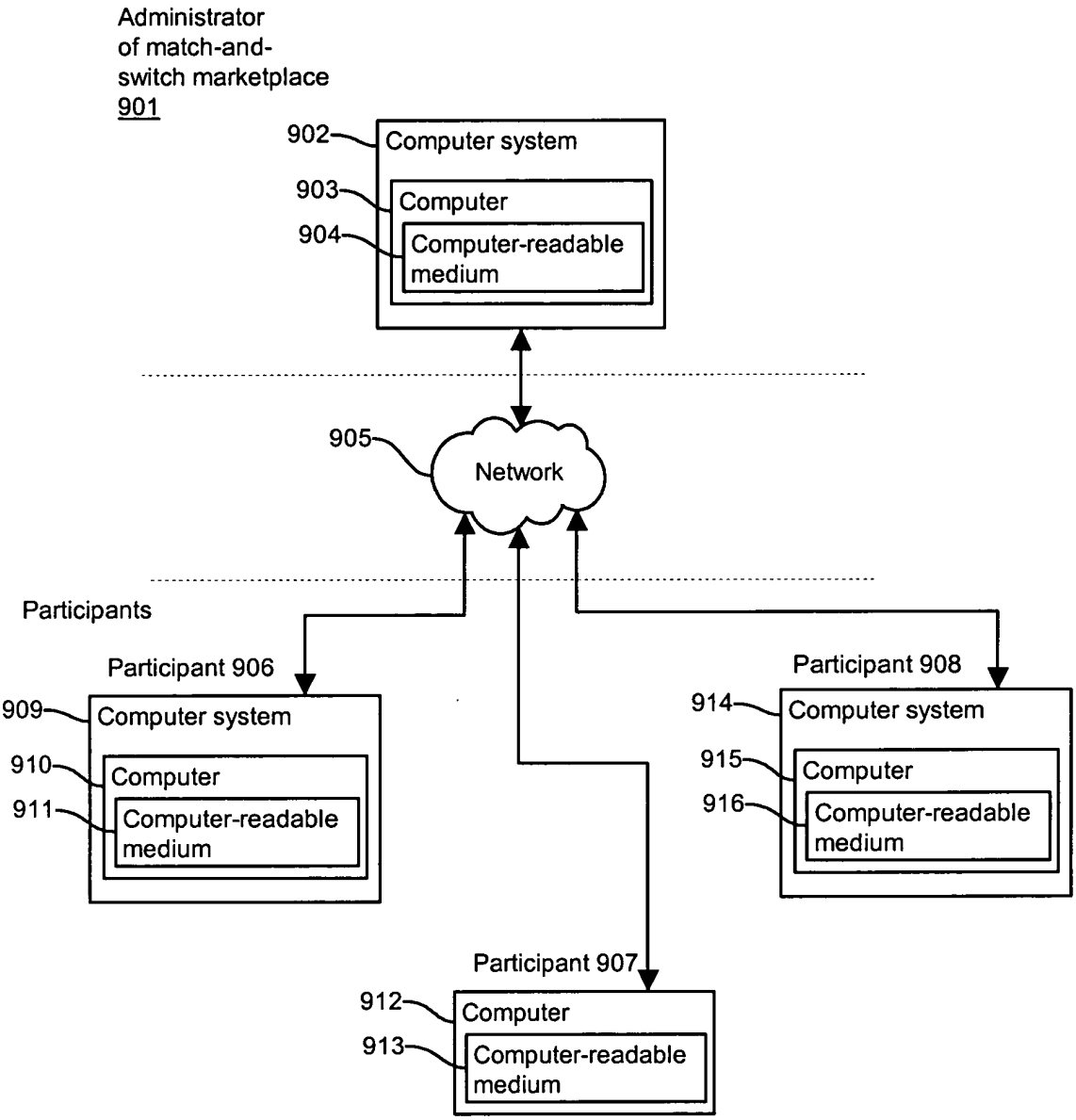

Administrator of match-and-switch marketplace 901
902
Computer system
903
Computer
904
Computer-readable medium
905
Network
Participants
Participant 906
909
Computer system
910
Computer
911
Computer-readable medium
Participant 907
912
Computer
913
Computer-readable medium
Participant 908
914
Computer system
915
Computer
916
Computer-readable medium

FIG. 10